

REMARKS

In the Office Action mailed December 30, 2005, the Examiner indicated that claims 3 and 6, although objected to, would be allowable if rewritten in independent form. In addition, claims 15 and 16 were indicated as being allowable if rewritten to overcome an objection under 35 U.S.C. §112, described in greater detail herein.

The remaining claims of the present application however, were rejected. Specifically, claims 13-18 were rejected under §112, second paragraph, for allegedly being indefinite.

Claims 1, 2, 4, 5, 10-14, 18 and 19 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. patent 5,519,636 to Stoll et al.

Claims 8 and 9 were rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. §103 as obvious over the noted '636 patent to Stoll et al.

Claims 1, 2, 5, 7, 11 and 12 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. patent 4,811,561 to Edwards et al.

Claims 1, 2, 4, 5, 7-14, and 17-19 were rejected under 35 U.S.C. §103 as being obvious and thus unpatentable over U.S. patent 6,119,721 to Watanabe et al. in view of U.S. patent 6,382,257 to Mead et al. and the previously noted '561 patent to Edwards et al.

Applicants appreciate the review of the present application by the Examiner. It is respectfully submitted that in view of the clarifications noted herein, all claims 1-19 are in condition for allowance.

A. Rejection of Claims 13-18 Under §112, Second Paragraph Has Been Remedied

These claims were rejected as follows:

Claims 13-18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13 last 3 lines (emphasis added) "each said unit ...adapted to transmit information concerning the identity of said

respective valve by said information element" is confusing, since it appears that the unit does not transmit the information via the information element. Suggest that "by" be replaced by -generated by—or -from-.

Claims not specifically mentioned are indefinite, since they depend from one of the above claims.

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Claim 13 has been clarified in accordance with the Examiner's helpful suggestions. In view of this, it is submitted that the rejection of claims 13-18 under §112, second paragraph be withdrawn.

Claim 15 was also clarified in this manner.

B. Rejection of Claims 1, 2, 4, 5, 10-14, 18 and 19 Should Be Withdrawn

These claims were rejected as follows:

Claims 1, 2, 4, 5, 10-14, 18 and 19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Stoll et al. Stoll et al discloses an electro-pneumatic assembly comprising a plurality of valves (part of 19, 23), each disposed in a respective recess in a common valve body (e.g. fig 1), and engaged by a respective actuator (part of 19, 23); a bus type digital interface type data transmission system (28) providing communication between a control unit (27) and each of a plurality of reader units (32, 33) each in communication with a respective one of a plurality of transponder type information elements (column 4 line 9-22), wherein each of the information elements is proximate to and adapted to identify the respective valve.

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Of these rejected claims, claims 1, 13, and 19 are independent claims.

Independent claim 1 recites an assembly for use in mining operations and particularly in an underground self-advancing roof support system. The assembly comprises a hydraulic component, a collection of actuators and/or sensors, a collection of reader units, and a collection of information elements. Each of the actuators and/or sensors is recited in claim 1 as having a housing and adapted for communication with a control unit via a data transmission system. Each actuator is configured to actuate a respective function of the hydraulic component, and/or each sensor is configured to measure the hydraulic state of a respective variable of the hydraulic component or another measurable variable associated with the self-advancing roof support system. With regard to the collection of reader units, each of the units is associated with a corresponding actuator or sensor. And, each reader unit is disposed proximate the

corresponding actuator and/or sensor. As to the information elements, each is associated with a particular function or measuring point of the hydraulic component. Information in each information element is readable by a corresponding reader unit and transmittable to the control unit.

Independent claim 13 recites an electro-hydraulic assembly that is adapted for use with an underground self-advancing roof support as utilized in mining operations. The assembly comprises a valve body defining a collection of recesses adapted for receiving and retaining hydraulic valves, a collection of hydraulic valves, in which each of the valves is disposed in a respective recess defined in the valve body. The assembly also comprises a collection of actuators, each actuator is in operable engagement with a respective valve of the collection of valves. The assembly further comprises a collection of information elements, in which each element is disposed proximate to a respective valve and adapted to identify the valve. The assembly also comprises a collection of reader units in which each unit is in communication with a respective information element and adapted to transmit information concerning the identity of the respective valve from the information element.

Independent claim 19 recites an electro-hydraulic assembly for use with an underground self-advancing support for mining. The assembly comprises a hydraulic body defining a first set of recesses and a second set of recesses. The assembly also comprises at least one hydraulic control valve disposed in one of the first set of recesses of the hydraulic body. The assembly also comprises at least one actuator configured to actuate the at least one hydraulic control valve. The assembly further comprises at least one information element disposed in one of the second set of recesses. The information element is configured to provide information as to the identity of the valve disposed in the hydraulic body. And, the assembly comprises at least one reader unit in communication with the information element and adapted to transmit the information as to the identity of the valve disposed in the hydraulic body.

Upon closer review, it will be appreciated that the '636 patent to Stoll et al., fails to anticipate any of the claims at issue. Each of the independent claims recites an assembly that is adapted for use in mining operations and particularly, for use with an underground self-advancing roof support as used in such operations. The '636 patent

entirely fails to disclose this adaptation. Instead, the '636 patent discloses a control device for a modular valve array, using electrically controlled valves. Stoll et al. entirely fail to mention any aspects of their control device, as being directed for use with an underground self-advancing roof support system.

Moreover, independent claim 1 recites the assembly as comprising, in part, a plurality of information elements each of which is associated with "a particular function or measuring point of the hydraulic component."

Stoll et al. merely disclose, at most, a collection of address decoders that serve to provide sequential configuration of modules and automatic assignment of addresses. Stoll et al. fail to disclose their address decoders as also providing information associated with "a particular function or measuring point" of a module.

Furthermore, Stoll et al. completely fail to disclose various aspects concerning proximities or locations of certain components to others, as expressly recited in each of the independent claims. For example, claim 1 recites that "each said reader unit [is] disposed proximate said corresponding actuator or sensor." Independent claim 13 recites that "each said [information] element [is] disposed proximate to a respective valve." And, independent claim 19 recites that "at least one information element [is] disposed in one of said second set of recesses [that are defined in a hydraulic body]." Stoll et al. fail to disclose any aspects as to the proximity or location of components in their system. The most that Stoll et al. disclose in this regard, is that their system components are connected to one another via a bus line system.

The Examiner is respectfully reminded of the standard for properly rejecting a claim under 35 U.S.C. §102. "Anticipation under 35 U.S.C. §102 requires that a single prior art reference disclose each and every limitation of the claimed invention." *Moba, B.V. v. Diamond automation, Inc.*, 325 F.3d 1306, 66 USPQ2d 1429 (Fed. Cir. 2003). "Anticipation under Section 102 can be found only if a reference shows exactly what is claimed," *Titanium Metals Corp. v. Bonner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). The '636 patent fails to show exactly what is claimed in each of the independent claims at issue.

For at least these reasons, it is submitted that each of the independent claims 1, 13, and 19 are allowable over the limited disclosure of the '636 patent to Stoll et al.

Since these claims are allowable, so, too, are claims 2, 4, 5, 10-12, 14, and 18, dependent therefrom.

C. Rejection of Claims 8 and 9 Should Be Withdrawn

These claims were rejected as follows:

Claims 8 and 9 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Stoll et al. Stoll et al. discloses all the elements of claims 8 and 9, but does not specify that the reader unit and the information element are sealed in casting compound. Inherently, electronic elements are sealed in casting compound, to protect them from the environment. Since the reader unit and the information element are electronic elements, they would be inherently sealed in casting compound. If not, it would have been obvious at the time the invention was made to one having ordinary skill in the art to seal the reader unit and the information element in casting compound, for the purpose of protecting them from the environment.

Pages 2-3 of the Office Action.

Claims 8 and 9 are each dependent from independent claim 1. Independent claim 1 was previously described under subheading B. Since, for the previously expressed reasons, claim 1 is allowable over the '636 patent to Stoll et al., so, too, are claims 8 and 9.

Moreover, it is further submitted that upon closer review, it will be appreciated that neither claim 8 nor 9 can be properly rejected under §102 or §103 based upon the '636 patent.

First considering a rejection under §102, since Stoll et al. fail to disclose the sealing aspects recited in claims 8 and 9, then clearly Stoll et al. fail to anticipate claims 8 and 9. It was admitted that Stoll et al. fail to disclose that the reader unit and the information element are sealed in casting compound.

Similarly, as for the issue of those claims being obvious in view of the '636 patent, that theory also fails since Stoll et al. fail to provide any teaching or even a suggestion of sealing each reader unit in casting compound and securing to a corresponding actuator (claim 8); or securing each information element within a receiving recess defined in a hydraulic component and sealing in casting compound (claim 9).

Instead, the rejection of claims 8 and 9 is apparently based upon an inherency theory, i.e. that although Stoll et al. fail to disclose or teach the aspects recited by claims 8 and 9, such aspects would be "inherent."

The standard for such an inherency rejection was pronounced by the Court of Appeals for the Federal circuit as, "[i]nherency may not be established by probabilities or possibilities." *Scaltech Inc. v. Retec/Tefra, LLC*, 178 F.3d 1378, 51 USPQ2d 1055 (Fed. Cir. 1999), *revising* 156 F.3d 1193, USPQ2d 1037 (Fed. Cir. 1998).

More recently, the Federal Circuit has required that the asserted inherent aspect is "necessary". "Anticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation..." *Transclean Corp. v. Bridgewood Services, Inc.*, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002). Similarly, in *Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc.*, 344 F.3d 1186, 68 USPQ2d 1186 (Fed. Cir. 2003), the court held, "[a] claim limitation is inherent in the prior art if it is necessarily present in the prior art, not merely probably or possibly present."

Contrary to the argument of the present rejection, the recited features of the sealing aspects are not inherent in the recited hydraulic actuating assemblies. That is, using the language from the Court of Appeals for the Federal circuit, such assemblies do not necessarily exhibit these features. In point of fact, numerous hydraulic actuating assemblies exist that do not utilize reader units which are sealed in casting compound and secured to a corresponding actuator (i.e. as recited in claim 8) or, that utilize an information element that is sealed in casting compound and secured within a receiving recess defined in a hydraulic component (as in claim 9). In point of fact, numerous hydraulic assemblies exist that do not utilize such sealing strategies, and so, the recited features are not inherent.

In view of the foregoing, it is respectfully submitted that the present rejection be withdrawn.

D. Rejection of Claims 1, 2, 5, 7, 11, and 12 Should Be Withdrawn

These claims were rejected as follows:

Claims 1, 2, 5, 7, 11 and 12 are rejected under 35 U.S.C. §

102(b) as being anticipated by Edwards et al.

* * *

Edwards et al teaches, for an electro-hydraulic assembly comprising a plurality of hydraulic valves (e.g. 30C), each engaged by a respective actuator (controlled by 76); a bus type digital interface type data transmission system (44) providing communication between a master control system (42) and each of a plurality of local control systems (e.g. 30B); that each of the local control systems includes a reader unit (84), which includes a transmitting module and a receiving module, and is in communication with a transmitter type information element (88), adapted to identify the respective valve (and rest of the local unit).

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Of these claims, claim 1 is the only independent claim. As previously described, claim 1 recites an assembly for use in mining operations and particularly in an underground self-advancing roof support system. The assembly comprises a hydraulic component, a collection of actuators and/or sensors, a collection of reader units, and a collection of information elements. Each of the actuators and/or sensors is recited in claim 1 as having a housing and adapted for communication with a control unit via a data transmission system. Each actuator is configured to actuate a respective function of the hydraulic component, and/or each sensor is configured to measure the hydraulic state of a respective variable of the hydraulic component or another measurable variable associated with the self-advancing roof support system. With regard to the collection of reader units, each of the units is associated with a corresponding actuator or sensor. And, each reader unit is disposed proximate the corresponding actuator and/or sensor. As to the information elements, each is associated with a particular function or measuring point of the hydraulic component. Information in each information element is readable by a corresponding reader unit and transmittable to the control unit.

The '561 patent to Edwards et al. describes a distributed control system, representing the state of such art twenty (20) years ago. Edwards et al. fail to disclose the assembly of claim 1 for several reasons. Edwards et al. fail to disclose their system as being adapted for use in mining operations and particularly an underground self-advancing roof support system. The most that Edwards et al. disclose in this regard is that their control system can be used in an excavator having a boom, arm, and bucket.

Such excavators are not similar to, nor do they correspond to underground self-advancing roof support systems.

Regardless, the '561 patent to Edwards et al. fails to anticipate claim 1 on other grounds. For instance, that patent fails to disclose a plurality of information elements, each being associated with a particular function or measuring point of a hydraulic component, and such information in each element being readable by a corresponding reader unit, as recited in claim 1.

The most that Edwards et al. disclose in this regard is in col. 4, lines 29-60 and Fig. 4. Fig. 4 of the '561 patent illustrates a control loop that includes a microprocessor controller 70 that controls a servo valve 30C which in turn operates an actuator 30. A position transducer 78 arguably functions as a sensor and provides a data signal Y as to the position of the boom 20 to the controller 70. Edwards et al. fails to disclose a plurality of information elements, "each information element being associated with a particular function or measuring point of the hydraulic component, information in each information element being readable by a corresponding reader unit." As explained in the specification of the present application, in a preferred embodiment, "[s]tored on each information element...is an item of information which enables clear identification of the information element...by the control unit." See page 6 of the present application. Additionally, it is explained that...each information element is different from the others in regard to the stored data. Edwards et al. simply fail to disclose the provision of such information elements, and clearly fail to disclose these aspects in conjunction with the transducers or sensors described in the '561 patent. The position transducer 78 does not correspond to the recited information element since it does not store any information that provides identification. Similarly, there is no disclosure of the combination of a sensor and an information element.

As set forth above, the Examiner's interpretation of the '561 patent to Edwards et al. is provided. However, upon closer review, it will be appreciated that the alleged correspondence between the recited components of claim 1 and items disclosed by Edwards et al. fails. Specifically, it is argued that in Fig. 5 of the '561 patent, the block 84 corresponds to a reader unit 84.

Instead, as noted in col. 4, line 62 of the '561 patent, item 84 is a microprocessor. As explained on page 4 of the present application, in a preferred embodiment, the reader units comprise transmitting and receiver modules, and are designed for transmitting or receiving electromagnetic waves. Often, coils are used. The microprocessor 84 as described by Edwards et al. does not correspond to the recited reader units.

For at least these reasons, it will be appreciated that neither claim 1, nor any of the claims depending therefrom, are anticipated by the '561 patent to Edwards. Accordingly, it is requested that this ground of rejection be withdrawn.

E. Rejection of Claims 1, 2, 4, 5, 7-14, and 17-19 Should Be Withdrawn

These claims were rejected as follows:

Claims 1, 2, 4, 5, 7-14, and 17-19 are rejected under 35 U.S.C. § 103 as being unpatentable over Watanabe et al in view of Mead et al and Edwards et al. Watanabe et al discloses an electro-pneumatic assembly comprising a plurality of valves (each in a respective electropneumatic regulator system 10, fig 1 and 2), each disposed in a respective recess in a respective valve body (part of 22), and engaged by a respective actuator (part of 22); a bus type digital interface type data transmission system (14, e.g. column 4 line 6) providing communication between a master control system (12) and each of a plurality of local control systems (26, 28), wherein each of the local control units includes a transmitting module and a receiving module, and is able to transmit information concerning the identity of the respective valve (ID address, see e.g. fig 3); but does not disclose that the assembly is an electro-hydraulic assembly; that each of the respective valve bodies are in a common valve body having respective recesses for the valves; that there is a plurality of reader units, each in communication with a respective one of a plurality of transmitter or transponder type information elements, wherein each of the information elements is proximate to and adapted to identify the respective valve, and in respective second recesses in the valve body and sealed thereon; wherein each reader unit includes a transmitting module and a receiving module.

Mead et al teaches, for an electro-pneumatic hydraulic assembly comprising a plurality of hydraulic valves (in 45 not shown), each engaged by a respective actuator (part of 44, not shown); a bus type digital interface type data transmission system (16, 18, e.g. column 4 line 37-42) providing communication between a master control system (connected to 24) and each of a plurality of local control systems (22); the equivalence of being either an electro-pneumatic assembly and an electro-hydraulic assembly (e.g. column 3 line 67); that the respective valve bodies are each in a respective first recess (located in 44, not shown), in a common valve body (all of the elements 1, 44 assembled into a common body, fig 1), and the local control units are each in a respective second recess (6), in the common valve body (1, 44) and sealed.

Since the systems of Watanabe et al and Mead et al are functionally equivalent in the piston art; it would have been obvious at the time the invention was made to one having ordinary skill in the art to make the electro-pneumatic assembly of Watanabe et al an electro-hydraulic assembly; to locate each of the respective valve bodies of Watanabe et al in a respective first recess, in a common valve body, and locate each of the local control units of Watanabe et al in a respective second recess, in the common valve body and sealed, as taught by Mead et al, as a matter of engineering expediency.

Since the modified Watanabe et al doesn't show all of the details of the local control system and Edwards et al does; it would have been obvious at the time the invention was made to one having ordinary skill in the art to make the local control units of Watanabe et al include a reader unit, which includes a transmitting module and a receiving module, and is in communication with an information element, adapted to identify the respective valve, as taught by Edwards et al, as a matter of engineering expediency.

Pages 3-5 of the Office Action.

Of the rejected claims, claims 1, 13, and 19 are independent claims. These claims were previously described under subheading B, herein.

The primary reference at issue is the '721 patent to Watanabe et al. This patent is directed to various industrial applications (col. 1, lines 13-25) of electropneumatic regulators. Watanabe et al. entirely fail to teach an assembly adapted for use in mining operations, and particularly for use with an underground self-advancing roof support.

Watanabe et al. merely describe an electropneumatic regulator system. The control system described by Watanabe et al. utilizes a control strategy in which certain process information is of concern to the controller during start-up, thereby allowing a greater use of controller resources to handling actual live data during the process. This strategy is explained at col. 14, line 48 to col. 15, line 30. The '721 patent to Watanabe fails to teach the mining assemblies as recited in the claims at issue.

The '257 patent to Mead et al. describe a modular fluid control system. Mead et al. describe their fluid control system as one that is easily configured simply by fitting together various modules. Again, the '257 patent has nothing to do with providing electro-hydraulic assemblies adapted for use in mining assemblies and particularly for use with underground self-advancing roof support systems.

The deficiencies of the '561 patent were previously explained.

Turning attention to the claims at issue, independent claim 1 recites an assembly adapted for use in mining operations and particularly an underground self-advancing

roof support system. Claim 1 specifically recites the assembly as comprising, in part, a plurality of actuators and/or sensors, in which each sensor is configured to measure the hydraulic state of a respective variable of the hydraulic component or another measurable variable associated with the self-advancing roof support system. The '721 patent to Watanabe et al. entirely fails to teach the use of sensors configured to measure hydraulic states of variables associated with a self-advancing roof support system. Neither of the '257 patent to Mead et al. nor the '561 patent to Edwards et al. remedies this deficiency.

Additionally, claims 8 and 9, each dependent from claim 1, recite that a reader unit or an information element of claim 1 is sealed in casting compound. Again, the '721 patent to Watanabe et al. entirely fails to disclose this feature. Neither of the patents to Mead et al. nor Edwards et al. provide the requisite teaching for this sealing feature.

Claim 10, dependent from independent claim 1, recites that a hydraulic component of the assembly in claim 1, is a valve block defining a plurality of receiving holes for hydraulic switching valves and each information element of the plurality of information elements is associated with a respective receiving hole or switching valve. Again, the '721 patent to Watanabe et al. entirely fails to teach such a configuration for the hydraulic component of the assembly of claim 1.

Independent claim 13 recites an electro-hydraulic assembly particularly adapted for use with an underground self-advancing roof support as used in mining operations. Claim 13 recites in part, that the assembly comprises a plurality of information elements in which each of the elements is disposed proximate to a respective valve and adapted to identify the valve. Claim 13 further recites that the assembly comprises in part, a plurality of reader units. Each of the reader units is in communication with a respective information element and is adapted to transmit information concerning the identity of the respective valve from the information element. The '721 patent to Watanabe et al. fails to teach such a configuration. Neither of the patents to Mead et al. nor Edwards et al. remedy this deficiency.

Moreover, dependent claim 17 recites that each reader unit of claim 13 is disposed on a corresponding actuator and sealed thereon. Similarly, dependent claim 18 recites the assembly of claim 13 in which each information element is disposed

within a corresponding recess defined in the valve body and sealed therein. Neither of these configurations is taught by Watanabe et al. in the '721 patent. Neither of the '257 patent to Mead et al. nor the '561 to Edwards et al. teach or even suggest this sealed configuration.

Independent claim 19 recites an electro-hydraulic assembly for use with an underground self-advancing support for mining. Claim 19 specifically recites the assembly as comprising at least one information element disposed in a recess which is defined in a hydraulic body. The information element is configured to provide information as to the identity of the valve disposed in the hydraulic body. Claim 19 further recites the assembly as comprising at least one reader unit in communication with the information element and adapted to transmit information as to the identity of the valve disposed in the hydraulic body. Again, the '721 patent to Watanabe et al. fails to teach or even suggest this particular configuration. The '257 patent to Mead et al., as previously described, merely describes a fluid control system and does not contain the requisite teachings for the information element and reader units. Likewise, the '561 patent to Edwards et al. similarly fails.

In view of the foregoing, it is respectfully submitted that each of independent claims 1, 13, and 19 is allowable over the cited art. And, since claims 2, 4-5, and 7-12 are dependent from claim 1 and so contain all of the recitations of claim 1, each of these claims is also allowable over the cited art. Similarly, since claims 14 and 17-18 depend from independent claim 13 and thus contain the recitations of that claim, each of these claims is allowable over the cited art.

In view of the foregoing, it is respectfully submitted that the rejection be withdrawn and all claims be allowed.

F. Allowance of Claims 3, 6, 15, and 16

In the Office Action, it was noted that:

Claims 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 15 and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim

and any intervening claims.

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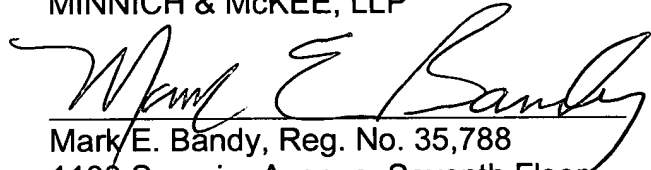
In view of the amendments presented herein, it is submitted that these claims are in condition for allowance.

CONCLUSION

In view of the clarifying remarks and amendments presented herein, it is respectfully submitted that all of claims 1-19 are in condition for allowance.

Respectfully submitted,

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February 21, 2006
Date

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